Anthrax

Bioterrorism Agent Profiles for Health Care Workers

Causative Agent:

Bacillus anthracis is a spore-forming, rod-shaped gram-positive bacillus.

Routes of Exposure:

Inhalational, Oral through consumption of insufficiently cooked contaminated meat from cattle, deer and other large herbivores, or Contact

Infective Dose & Infectivity:

8,000-50,000 spores

Incubation Period:

The incubation period following pulmonary exposure to anthrax is 1-60 days, with most cases occurring 1-6 days after exposure.

Clinical Effects:

Anthrax can occur in three forms: pulmonary, cutaneous, or gastrointestinal. Patients with pulmonary anthrax will initially experience a non-specific prodrome of flu-like symptoms including fever, myalgia, headache, non-productive cough, and mild chest discomfort. Following the prodromal period, patients may experience a brief interim improvement. Two to four days after initial symptoms, patients will experience abrupt onset of respiratory failure, high fever and hemodynamic collapse, possibly followed by thoracic edema, pleural effusion and widened mediastinum. Approximately 50% of all cases are accompanied by hemorrhagic meningitis.

Laboratory testing:

Sputum culture and gram stain are unlikely to be diagnostic given the lack of a pneumonic process. The most useful microbiologic test is the standard blood culture, which should show growth in 6 to 24 hours. If the laboratory has been alerted to the possibility of anthrax, biochemical testing and review of colonial morphology should provide a preliminary diagnosis within 12 to 24 hours. Real time DNA and antigen testing capabilities are in the final stages of development and will be available through state laboratories. Definitive diagnosis would require an additional 1 to 2 days of testing in all but a few national reference laboratories.

Lethality:

Without treatment, the mortality rate of inhalational anthrax is almost 100%. Almost all inhalational cases in which treatment was begun after patients were significantly symptomatic have been fatal.

Transmissibility:

Person-to-person transmission of anthrax does not occur.

Primary contamination & Methods of Dissemination:

Anthrax would most likely be delivered through aerosolization of spores. Contact of spores with open cuts and sores on the skin can result in cutaneous anthrax.

Secondary Contamination & Persistence of organism:

Spores can persist in the environment indefinitely. However, secondary aerosolization of the spores is unlikely.

Decontamination & Isolation:

Patients- Exposed areas of skin should be rinsed with soap and water. Gross decontamination is unnecessary and inappropriate. Patients with anthrax should be managed using standard precautions.

Equipment, clothing & other objects- Hypochlorite is effective in cleaning the environment.

Outbreak control:

There is no need to immunize or give prophylactic treatment to contacts of infected patients who were not exposed to the initial aerosol.

Treatment:

The recommended treatment for anthrax is IV penicillin, 2 million units every two hours. However, because of the concern of penicillin resistance, ciprofloxacin 400 mg IV every 8-12 hours, or doxycycline 200 mg IV followed by 100 mg IV every 8-12 hours can be used.

Prophylaxis:

The recommended post-exposure prophylaxis for exposure to *B. anthracis* is ciprofloxacin 500 mg orally two times daily for four weeks, or doxycycline 100 mg orally two times daily for four weeks.

Differential Diagnosis:

Anthrax should be strongly considered in any previous healthy patient that presents with acute mediastinitis. Additionally, the differential diagnoses should include: bacterial pneumonias (usually without infiltrates), including pneumonic plague and tularemia, Gram negative sepsis, Influenza, and other influenza-like illnesses.

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